A Study of Washington State Child Support Orders Exploring the Universe of Cases within the Context of the Child Support Schedule

MAPS Unit
Division of Child Support
Washington State DSHS
P.O. Box 9162
Olympia, WA 98507

Semi-Annual Performance Report of the Research Project New Approaches to Collecting Child Support Arrearages: Determining the Composition and Collectibility of Arrearages

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PROJECT SUMMARY ABSTRACT

The child support order is the cornerstone on which the case is built. This project seeks to investigate the outcomes that flow from the point of order origin, which relate to the goals of the Strategic Plan of the Office of Child Support Enforcement of increasing collection of child support, both current support and arrearages.

The Washington's Division of Child Support schedule project has four distinct parts. The first segment is a comparative analysis of the non-IV-D child support cases with the IV-D cases. The second part is a process analysis of how child support orders are set in the absence of income information from the nonresidential parent and/or the non-appearance of the nonresidential parent. Third is a review of the economic literature on the expenditures on children and how Washington's support schedule measures up in terms of economic data and policy issues. Fourth, we proposed a limited pilot project on automating the data needed for support schedule reviews.

Washington State proposed an exploratory study to understand the processes and components of how child support orders are set. The federal requirement that all child support orders be sent to a central support registry effective October 1, 1998 has made it possible to examine the universe of child support cases. By allowing an examination of the child support worksheets used to document the income and circumstances whereby child support is set for all parties in the state, it makes it feasible to assess the full scope of child support orders not just those within the Title IV-D system. Washington's Division of Child Support will know how representative its caseload is relative to all formal child support cases. We will document the characteristics of the universe and the strata within. The strata include cases that become IV-D cases through public assistance and through application for services and those that remain outside the child support agency as direct, private payment between the parties or as non-IV-D payment service only through the central child support registry. Further, we plan to match the sample of child support cases with other public sector databases to determine public assistance usage. We can track the conversion of cases from one stratum to another.

Through an analysis of orders, the state's support schedule will provide the context for understanding the relevance of the order amounts. Because the amount of support awarded impacts the well being of children, there is renewed interest in the schedule itself in terms of what it does and does not do. Can the schedule provide continuity of expenditures after dissolution of the relationship? How does the schedule affect children at different income levels? Is poverty reduction a realistic goal? We are also interested in the implications for the parents in terms of equity, ability to pay, second families and children in multiple households, to mention a few policy issues.

In addition to looking at the economic theories that underlie the schedule, there is the practical issue of how states conduct their four-year reviews. In Washington, the Legislature arranges for the review. The reviews have involved sampling the summary sheets from the child support worksheets, which are retained in their paper form. At present, the documents of the non-IV-D child support cases are available in an imaged format through the Washington State Support Registry (WSSR). The imaged forms include the support order and worksheets that detail the income of the parents, the children's ages, and other relevant circumstances that affect the amount of child support. We proposed a small-scale pilot project to create a database that could allow a review of the schedule from an automated data capture system that is readily available for analysis.

Progress to Date

We rearranged the priorities of the project as we began our resource allocation process. Initially, we had thought we would hire a person who had child support casework experience. Instead, an agricultural economist became available, which actually fit our needs much more closely in terms of conducting the literature review on the cost of raising a child. Economists, especially agricultural economists, have written most of that body of literature. Because of our good fortune, we moved the economic literature review to the top of our priorities. The literature review is included in this report.

While the literature review was being completed, we grappled with the thorny issue of data identification and collection. Finally, we have settled on a time frame for sampling: October 1, 2000 through February 28, 2001.

From that period, we have a total of 18,375 cases. These cases are broken into the following strata:

- Direct Pay (One party pays child support to the other directly—not IV-D) 2,075
- PSO (Payment Service Only—payment through the registry—not IV-D)   782
- Court Ordered (IV-D cases)   10,075
- Administratively Ordered (IV-D)   5,443

By focusing on the most current cases, we hope to capture current practices in setting orders or in modifying orders. We also hope that the central registry staff will have imaged some of the cases selected for the sample. The process for determining the sample size has begun with reviews of about 20 cases from each stratum. It is necessary to determine how complete the documentation is before we proceed. For example, are all pages of the worksheet available? Are the orders available? How much of the data are in the automated system? Once existing data elements are known, we can then identify remaining data elements that must be gathered from other sources. Because data entry is expensive in terms of money and time, we are trying to limit the number of data elements that we need from worksheets and orders. Then, there is the problem of lack of uniformity in the underlying documents. While worksheets are standard in terms of

having numbered line items, orders are not. Data entry staff tend to like uniformity in documents to ensure accuracy.

Our hopes of using the forms that summarized the bases for setting child support order amounts and documenting deviations from the child support schedule were dashed after finding them missing most of the time in the scanned order database. Upon further investigation, we also found that the summary sheets no longer synchronize with the worksheets.

State law did not mandate that the summary sheets be completed. Instead, their use was strongly encouraged. The worksheets are required, and failure to comply is punishable under perjury laws.

What is disturbing about this discovery is that previous child support schedule reviews have been conducted on the summary sheets only. The summary sheets were, in fact, created for the support schedule reviews to ensure the schedule was being used and that any deviations were documented. The unintended consequence of basing the reviews solely on the summary sheets, which are not mandated, is that the reviews are biased because the summary sheets are not universally completed. Sampling is currently done on the completed summary sheets, which are submitted at the time that the order amount is set. The problem is, of course, that the summary sheets appear to be completed only by some judges in some jurisdictions. Washington State is planning on hiring a private firm to conduct the child support schedule review this summer, which hopefully will give us an opportunity to investigate this issue further.

Proposed Pilot Project

The SEMS programmers have begun the automation of the worksheets for the Washington State Support Schedule. Support Enforcement Officers and Prosecuting Attorneys can access the computation program from a web site to determine the amount of support for a child support order. The results are then saved in an SQL database. The database has been made available to us. We are currently in the process of evaluating its usefulness for mining the database for data elements for this project as well as its usefulness in conducting an automated support schedule review. This process would be much less labor intensive than our proposed scanning of the worksheets.

Literature Review

A literature review of economic models on expenditures on children has been conducted. It is attached.

Time Line

The project began October 1, 2000 and continues through February 28, 2002, for a period of 17 months. The updated Gantt chart is attached (*See Appendix*).

Project Staff

The abbreviated resume of the economist, Fanny Nyaribo-Roberts follows.

New Project Staff

FANNY NYARIBO-ROBERTS

EDUCATION: Ph.D. 1989. Washington State University, Agricultural Economics. M.S.1982. University of Arkansas, Agricultural Economics. B.S. 1980. Southern Illinois University.

PROFESSIONAL EXPERIENCE:

5/98-12/00 Research Associate, WIMIRT/DSHS, Mental Health Division. Provided technical assistance and SAS programming; assisted in developing service utilization and cost data bases; conducted cost-effectiveness analyses of mental health programs; and implemented and administered the SAS Warehouse Administrator.

7/97-4/98 Research Investigator, Employment Security, Labor Market & Economic Analysis. Conducted labor market and economic data analyses; provided SAS programming; and prepared quarterly summary federal reports on state labor statistics.

8/96-7/97 Research Investigator, DOH Center for Health Statistics. Conducted statistical analyses of data from the Behavioral Risk Factor Surveillance Survey; examined output for accuracy, completeness and to determine the validity of estimates for inferential purposes; and developed comprehensive data files and documentation.

6/95-3/96 & 8/93-11/94 Associate in Research, Department of Agricultural Economics, Washington State University. Designed methodology, implemented and conducted data analyses; made host country site visits; provided technical assistance to host country scientists in Burkina Faso, West Africa; authored, edited, and disseminated project publications and reports; and obtained $75,000 in additional funding.

3/93-7/93 Research Analyst, Department of Agricultural Economics, Washington State University. Analyzed survey data to assess benefits and challenges for economists involved in multidisciplinary research using mainframe SAS. Evaluated trends in apple production and compared costs and returns of conventional and organic potato farming.

1990-1992 Agricultural Economist, U.S. Title XII USAID Small Ruminant Collaborative Research Support Program/Kenya Site. Co-designed and implemented research activities, administrative and financial activities; supervised field and support staff; integrated biological research results into economic models; conducted on-farm monitoring and evaluation of production packages; analyzed small farm survey data; analyzed off-farm survey data such as marketing, pricing, credit and public policy.

1987-1989 Systems Documenter, Cooperative Extension, College of Agriculture and Home Economics, Washington State University. Prepared and documented users' manuals for computer programs written by Cooperative Extension Programmers of which 90 percent were farm management programs.

How Much Does It Cost to Rear a Child?
A Review of Economic Studies on Expenditures on Children
and Their Relationship to the Child Support Schedule

Justification

The purpose of this paper is to review current economic studies on expenditures on children and to evaluate the Washington State child support schedule and how it measures up to the findings presented in the economic studies.   An overview of major economic studies used to construct child support guidelines for different states in the U.S., including the state of Washington, is given. The discussion will include a brief review of the data and different methodologies used. Various models used to construct child support guidelines will be presented in order to give a context to Washington State's income shares model.

The Washington State child support schedule was put into effect on July 1, 1988, eleven years ago. One of the objectives of the child support guidelines was to improve the adequacy of child support orders by making them more consistent with economic evidence on the costs of child rearing. In 1988, federal law required that the child support schedule be reviewed every four years to ensure that the child support schedule was in line with current economic needs of children. None of the reviews has assessed the current economic needs of children in relation to the child support schedule.

Underlying Economic Theories of Estimating the "Cost of a Child"

Economic literature identifies three areas that inform policy on the cost of rearing a child (Lazear and Michael, 1988).   The first area of economics work is descriptive in nature and characterizes family spending patterns that can shed light on expenditures on a child. No conclusions, however, can be made about the welfare of children from this type of work. The second area of economics work is empirical in nature. In this case, systems of demand equations are formulated that characterize consumption and expenditure patterns of households. These equations assume *a priori* that a certain functional form is appropriate for the spending system, which imposes a formal structure on the spending system. If it can be assumed that the spending system is consistent with a given household's utility function, parameters of the utility function and expenditure system can be estimated. If the underlying assumptions are acceptable, then conclusions about the welfare of the children in a household can be reached. The third area deals with analytical studies of fertility behavior that look at the relationship between the number of children in a household, family income, the cost of a child and other explanatory factors or variables. These types of studies analyze the relationships between the number of children in households with different characteristics and how they relate to different levels of income and price.

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Before proceeding further it is necessary to define several terms used in studies to be reviewed in this paper. Lazear and Michael[1] give definitions for price, expenditure, cost, and welfare as follows:

- *The price of an item refers to the dollar value of the resources required to be traded or given up to acquire the item*.
- *Expenditure on an item is the outlay of resources*. The expenditure can be different from the price for two reasons. First, one may purchase more than one unit of something. The expenditure is price (p) multiplied by the number of units (q), *i.e.* expenditure = p x q. While p stays the same, several items of q may be purchased making expenditure not always equal to price. Second, the purchased item may be available in several qualities at different prices. The expenditure may be high or low depending on which quality is selected. Consumers may purchase different qualities of the product based on different income levels or different preferences. The price of the item does not change but the expenditure level does.
- *Cost measures the value of the resources used to produce the item as distinct from the value of the resources required to acquire the item*. The cost and the price of raising a child are the same. But, the expenditure is not equal to cost or price because society sometimes subsidizes or taxes the costs of raising a child; thus the cost to the family may be different from the social cost of that child.
- *Welfare refers to satisfaction or utility and involves preferences, tastes, or values*. A high level of expenditures does not necessarily reflect a high level of welfare. The link between expenditures and welfare can be made when family members' preferences are explicitly specified in a utility function.

Components of the Economic Cost of Raising a Child

1. Direct dollar disbursements including payments for goods and services consumed jointly by the family.
2. Indirect costs of time spent to take care of the child either by the parent or someone else.
3. Direct dollar contributions the child makes to the household.
4. Time contributions by the child to the household.

Adding up the four components will yield the price or cost of raising a child.

An accounting of expenditures for each family member would be a straightforward matter if it were possible to directly observe how each dollar is allocated among household members. This is not possible, however, because over 90 percent of family expenditures are allocated to shared goods (consumed jointly) like housing, transportation, food and some services.[2] It is difficult to apportion out that part of a bar of soap, or proportion of furniture, or proportion of milk used by the family's children. On the other hand, it is relatively easy to determine quantities of goods consumed by

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[1] Lazear and Michael, p. 196.
[2] Betson, 1990; U.S. Department of Health and Human Services (DHHS), 1987.

adults and children separately, such as adult clothing, or adult tobacco and alcohol consumption; it is also possible to determine expenditures on children's clothing or toys. Aside from the fact that very detailed household consumption data would be needed for each family member and the invasion of privacy involved, it still leaves the issue of how jointly consumed goods would be allocated.

Methods

Several methods have been suggested that attempt to overcome the difficulties of quantifying the cost of raising a child. These methods are:

1. **The Per Capita (or average) Method** is also referred to as the proportionate share method. The per capita method estimates the sum of all household expenditures divided by the number of people in the household. The main problem with this approach is it assumes that household expenditure patterns are known and, that the marginal expenditure for a new member of the household is equal to the average expenditure on an existing family member. It may not be the case, and indeed the marginal cost of an additional family member may be less than the average expenditure per household member. Per capita or average expenditure per household member may actually overestimate the real level of expenditures on children. The per capita method ignores the fact that adults consume more of the joint or pooled resources than children do. The other problem with this method is that the cost of children is marginal (additive). A couple without a child(ren) would still incur expenditures on housing, food, transportation and other shared goods. The problems mentioned above have resulted in the use of more complex analytical procedures, which indirectly estimate expenditures on children within households. These methods rely on the long known relationship between level of income and expenditures on food. [3]

2. **The Engel Estimator** was named after Ernest Engel (1895) whose research documented that the proportion of income spent on food differed at different levels of income and systematically declined as income rose. Because of the relationship between income and expenditures on food, the percentage of household income spent on food has been considered a good indicator of family well being. Thus, two families would be considered to have the same level of well being if the proportionate share of income spent on food was the same. Alternatively, if one family's proportionate share of expenditures on food were higher than the other family's, that family's well being would be considered to be higher than the other family's. [4]

3. An alternative estimator to the Engel estimator is the **Rothbarth Estimator**. The Rothbarth estimator is a modification of the Engel estimator, in which it is postulated that expenditures on children can be estimated by looking at their impact on levels of adult goods consumption. This method assumes that the level of the family's well being can be determined by the amount of excess income available for adult goods consumption such as alcohol, tobacco, entertainment, sweets and savings. Rothbarth

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[3] Barnow, U.S. DHHS, 1994.
[4] Barnow, U.S. DHHS, 1994.

defined these as luxury goods that could be indulged in only after meeting necessary household expenditures. This definition has been narrowed to include only those goods that are consumed exclusively by adults and are strictly observable adult goods.[5]

4. The **ISO-PROP** methodology is an expanded version of the Engel method. In addition to expenditures on food, it includes expenditures on clothing, housing, utilities and health care.

5. Other estimators have come up with what is referred to as "equivalence scale estimators," which do not incorporate the Engel or the Rothbarth assumptions (Prais and Houthaker, 1955; Barten, 1964; Gorman, 1976). An equivalence scale is defined as " …a ratio of expenditure levels across families of varying size and composition, that is required to achieve a fixed level of well-being."[6]

6. The U.S. Department of Agriculture (USDA) also periodically provides child-rearing estimates that do not rely on Engel's or Rothbarth's assumptions.[7]

Empirical Studies of Family Expenditures on Children

State child support guidelines are based on evidence from economic studies on how much it costs to raise a child. Before discussing the various studies that form the basis for child support guidelines nationwide, it should be pointed out that all the estimators and empirical studies suffer from varying degrees of advantages and disadvantages. Not all the advantages and disadvantages will be discussed; however, the one disadvantage that affects all studies across the board is the bias resulting from jointly consumed goods. As previously noted, expenditures on jointly consumed goods cannot be allocated to individual family members within the household. Because of this dilemma, some very strong assumptions need to be made in order to apply any of these estimators.

Certain biases are also introduced into the expenditure estimation process due to the assumptions embodied in Engel's and Rothbarth's estimators. In general, expenditure estimates based on Engel's assumption overestimate true expenditures while Rothbarth's assumption underestimates them. Therefore, estimates using Rothbarth yield lower bound expenditure estimates while estimates using Engel yield upper bound expenditure estimates.

In addition to previously existing literature and empirical studies (Henderson, 1949 and 1950; Cain, 1971; Reed and McIntosh, 1972), the National Institutes for Child Health and Human Development have funded a number of studies of expenditures on children based on the 1972-73 Consumer Expenditure Survey (CES, also commonly referred to as CEX). These studies provided a more accurate foundation for estimates of current family expenditures on children than those based on an earlier survey (U.S. DHHS, 1987). The five studies funded by the U.S. DHHS were done by Bentley *et al.* (1983), Espenshade (1983), Olson (1983), Turchi (June 1983), and Lazear and Michael (1988). Even more

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[5] Barnow, U.S. DHHS, 1994.
[6] U.S. DHHS, 1994.
[7] U.S. DHHS, 1994.

recent than these are the studies by Betson (1990) and the most recent publication on the cost of children from the USDA (2000).

Espenshade's study has been used to develop child support guidelines for a number of reasons. It uses Engel's estimator, which uses a standard food basket as a measure of well being. It is believed that this represents a more stable basket of goods. Other studies, namely Olson, Turchi, and Lazear and Michael used the Rothbarth estimator, which uses the level of adult spending on alcohol, tobacco and clothing as a measure of well being. Reporting of adult goods can be unreliable and expenditures on alcohol and tobacco are believed to be under-reported.[8] Table 1 below gives some estimates of expenditures on children from birth to their eighteenth birthday.

Table 1. Various Estimates of Expenditures on Children from Birth to 18 Years

Study and Year	Year Prices	Discount Rate	Low Economic Status	Moderate Economic Status	High Economic Status	All Income Levels
Cain (1971)	NA	8%	NA	$31000	NA	NA
	1977	Not discounted	$70,000	$107,000	$107,000	NA
Espenshade (1983)	1981	Not discounted				NA
-One child			$96,000	$106,200	$126,300	
-Two children			$149,900	$164,800	$196,600	
-Three children			$187,900	$206,400	$246,600	
Lazear & Michael (1988)	1970-71	10%	NA	$30,000	$115,000	NA
Lazear & Michael (1988)	1972	10%	$7,400	NA	$52,600	NA
USDA (1982)	1981	NA	NA	$80,000	NA	NA
Betson (1990)						
-One Child Home	1980-86	NA	NA	NA	NA	$137,129
-Two Child Home						$75,224
-Three Child Home						$92,112
USDA (2000)	1999	NA	$117,090	$160,140	$233,850	NA
BLS Subsistence (1981)	1981					
-One Child Home						$2253
-Two Child Home						$4198
-Three Child Home						$6155
BLS Above Subsist (1981)	1981					
-One Child Home			$40,556	$61,290	$110,794	
-Two Child Home			$75,558	$114,182	$156,544	
-Three Child Home			$110,794	$167,440	$229,588	

Note: NA denotes not available or not applicable.

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[8] U.S. DHHS, 1987.

Table 1 displays numbers from various studies that have attempted to determine the cost of raising a child up to age 18. These estimates vary due to different years, discount rates, data sources and methodological assumptions. It is expected that different estimates can and are obtained from the same data and same years as well as discount rates, depending on different incomes and household composition. For example, Lazear and Michael's study provides two sets of cost estimates because they use two different levels of income in their estimation procedures. In their first set of numbers they base their estimates on a two-child family with an annual income of $10,000 and a much wealthier family with an annual income of $50,000, using 1970-71 price levels. Lazear and Michael's second set of estimates are based on a typical white household with 2.19 children with an annual income of $5,000 and a much wealthier family with an annual income of $50,000, using 1972 price levels. The differences in the estimates are also due to the assumptions embodied in the methodology as well as the inclusion of some costs and not others. For example, in both Espenshade's studies the cost of taking time out (mostly by the mother) to raise the child is taken into account while it is not included in Lazear and Michael's study. Espenshade further distinguishes the value of the time taken, according to the education level of the primary child caretaker and thus has a low-cost, low-educated parent as opposed to a high-cost, college-educated parent. A key point that Lazear and Michael make with regard to different costs of raising children is worth noting:

> The resources devoted to the child reflect the parents' decision about the level of quality they choose. Now the distinction may seem academic, but it is an important difference. Imagine that we ask, "What is the price of a car?" We know that the price of a new car can vary by a factor of, say, five so the answer to the question is that the price of a car ranges from about $5,000 to maybe $25,000 today depending on the quality of the car. For some purposes it is adequate to know that an average car purchased today costs maybe $10,000. That surely informs us about the expense of that item compared to other consumption items such as houses or clothing or a college education. But it does not tell us very precisely what a particular family is likely to spend on a new car. The same is true for children.[9]

The authors further explain the differences in estimates due to different values on the primary caretaker's time…

> Another part of the difference in the Espenshade (1977) estimates is the fact that they include time values which differ among parents. The less-educated parent's time is valued at $3.28 per hour, while the more-educated parent's time is valued at $5.29 per hour in Espenshade's calculation. That difference is not a matter of choice (at least not in the short run), so it does reflect a difference in cost or price. In general, "quality" of the child cannot be ascertained independently of these

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[9] Lazear and Michael, p. 198.

*measured expenditures. That causes a confounding of differences in costs
faced by the parents and of differences in the quality of the child. Of
course, this problem is not restricted to the application to children but
exists in any circumstance where the quality of the product produced
cannot be easily ascertained independently of its costs of production.*[10]

Both the Espenshade and Lazear and Michael studies use the 1970-72 CEX data. Betson
has published a more recent study (1990) using data from the 1980-87 CEX survey. The
Center for Nutrition Policy and Promotion of the USDA has even more recent (2000)
estimates on expenditures on raising a child. The USDA used data from the 1990-92
consumer expenditure survey. It is to these two studies that the review will now turn.

Some other findings from Lazear and Michael are that, first, the addition of a child raises
total expenditures on children by about 10 percent while the addition of an adult lowers
total expenditures on children by about 30 percent. Second, as household income
increases there is a less than proportionate increase in expenditures on children. Lazear
and Michael present a discussion on consumption allocation within the household and
provide some empirical results to support their hypothesis that all individuals are not
treated equally in the household. Results from their study indicated that on average
children receive only about 40 percent of the consumption dollars relative to an adult in
the same household. Thus, assuming per capita or equal distribution of consumption
dollars in a household is an oversimplification of the intra-family allocation mechanism.
True, children require less than adults for their well being; therefore, the 40 percent
allocation is not necessarily an indication that they are deprived or that their utility is less
than that of an adult. What they are suggesting is that since adults determine how goods
are allocated within the family, there cannot be a guarantee that children's utility is
equalized to that of adults. As has been found in other studies as the number of children
increase, average expenditure per child falls, and expenditures rise with the age of the
child. Employment of both parents resulting in higher income results in higher
expenditures on the child.

Betson Study

The Betson study used the 1980-86 CEX to estimate the cost of raising a child using five
different methods. These methods are the per capita, Engel, ISO-PROP, Rothbarth, and
Barten-Gorman approaches.[11] This study provides one of the most comprehensive
approaches to evaluating each of these estimation methodologies, the results of which can
then be used to make policy decisions on the "best" approach given the data available.
Betson uses these methodologies to estimate costs of raising children in one- and two-
adult households with one, two and three children at various levels of expenditures. The
levels of expenditure range from $5,000 to $50,000 in $5,000 increments. For each of
the one-, two- and three-child families, Betson further gives estimates of the cost of one
child at three age levels (ages 4, 8 and 10). He then gives the cost of two children at three

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[10] Lazear and Michael, p. 199.
[11] Betson, 1990.

age levels with close and wider spacing (ages 4 and 8; ages 8 and 10; and ages 10 and 16). For three-child households, the following age groupings are considered: ages 4, 8 and 10; ages 4, 8 and 13; and ages 10, 13 and 16. As can be noted from the detail above, the Betson study provides an array of costs associated with different cost and household composition combinations.

With regard to cost, there is more variability in one-adult households than in two-adult households. The higher the number of children, the higher the total cost of raising children in that family. But as the number of children increases, the average cost per child does not increase. As a child grows older, the cost of that child rises as well. This last finding holds for all methodologies except the Rothbarth method. For households with expenditures up to $75,000 per year, there is an equiproportionate increase in expenditures on a child as household expenditures increase. Finally, a child in a one-adult household is more expensive to raise than in a two-adult household. In comparing the estimates from the five methodologies, Betson found that the Engel and per capita methods yielded cost estimates that were quite similar, with the per capita yielding the higher estimate. The Barten-Gorman methodology yielded the lowest cost estimates.

Estimates using the Rothbarth method were lower than the Engel and per capita methodologies. Estimates for one child were lowest with the ISO-PROP and Barten-Gorman approaches. In looking at the proportion of expenditures allocated to rearing one, two and three children in a one-parent household in percentage terms, Betson found that 50 percent, 67 percent and 75 percent of total expenditures are needed for such a household. Betson, in the end, points out that the variability of estimates across methods is not stochastic in nature but can be attributed to the choice of underlying assumptions. Thus, the estimates are going to vary according to the type of methodology used. This is apparent from examining the estimates on Tables 1 from different studies.   Betson questions the plausibility of using Engel's postulate, which deals with economies of scale in food consumption in our current economy and society.   He states that estimates using the Engel method should be discounted if they are to be used. In any case, from the literature it appears that the Engel and Rothbarth estimates are gaining acceptance as approximations of upper and lower bound estimates of child-rearing expenditures. Betson chooses the Rothbarth estimator as the "best" one for arriving at empirical estimates of child rearing expenditures.   The main findings of Betson's study are that first, the more children in a family the more it costs, but, as the number of children goes up the average cost per child does not go up. Second, as a child grows older, it also costs more to raise that child. Third, the total expenditures as a percent of total household expenditures stay the same across all income levels. The cost of a child to a single parent household is higher than the cost to a two-parent home, all else being equal.

USDA 1999 Study

The USDA study presents estimates for the cost of rearing a child up to age 17 for a two- and a single-parent family. The study was done to reflect three income levels and four regions, namely the West, Northeast, South and Midwest. Within these regions,

estimates were also derived for urban and rural areas. Due to a small sample size, estimates for single-parent families were derived for the overall U.S. population only. Unlike the Espenshade study, costs of the primary care taker namely, time costs and foregone earnings, are not included in the child rearing estimates. Likewise costs associated with foregone career opportunities are not included.

This study provides child-rearing estimates using the 1990-92 CEX survey data and therefore provides estimates based on the most recent data. Dollar figures were updated to 1999 prices using the 1999-regional/population size CPI. In deriving the child-rearing estimates, representative families had two children with a focus on the younger child. The age of the younger child was varied in order to obtain estimates of a younger child of different ages. The following younger child age groupings were used: 0-2, 3-5, 6-8, 9-11, 12-14 and 15-17 years of age. Gross annual income categories were as follows: for single-parent families, there were two income groups of less than $36,800 and greater than or equal to $36,800. Two-parent families had three gross income categories of less than $36,800, $36,800 to $61,900 and greater than $61,900.

Based on these assumptions, estimates of rearing a child up to 17 years of age in 1999 prices for the overall U.S. population were: $117,390, $160,140 and $233,850 for the lower, middle and highest income groups respectively (see Table 1). Translated to an annual figure these costs range from $6,080 to $7,150 for the low-income group, and $8,450 to $9,530 for the middle-income group and $12,550 to $13,800 the high-income group. When looking at total child rearing expenditures this study found that housing accounts for the largest percentage of these costs in all income groups. The older the child gets the higher the expenditures associated with raising that child across all income categories. The urban West was found to have the highest child rearing costs, followed by the urban Northeast, urban South while urban Midwest and rural areas have the lowest costs respectively.

U.S. Poverty Guidelines as a Reference Point for Minimum Standards for the Cost of Raising a Child

In addition to the empirical studies in the previous section, the U.S. poverty guidelines are used as reference points in setting child support obligations. The poverty guideline is defined as the minimum amount of money needed to meet adequate nutrition requirements of a family of a given size at the lowest level consistent with the standard of living of a population in a given part of the country. In addition, the amount of money spent on food for this given family size to meet these nutritional needs may not exceed 33 percent of the family's income.[12] The Bureau of Labor Statistics (BLS) minimum child-rearing costs in Table 1 are not routinely used for child support formulas because the BLS living standards are no longer updated, and they do not reflect lower cost of living conditions of rural families. Instead, what is used for developing child support

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[12] U.S. DHHS, 1987.

guidelines at this subsistence level are poverty guidelines. The poverty guidelines are widely recognized and regularly adjusted to account for inflation effects.

From Empirical Estimates to Child Support Economic Tables

Results from child-rearing studies were used and are currently used to construct economic tables reflecting standards of living above subsistence and to reflect current cost of living standards and economic trends. The question now arises as to how one translates child-rearing estimates to actual child support numbers used in the child support guidelines. Briefly, the procedure involves taking the numbers from a particular study and expressing those numbers as a percent of total expenditures.

The state of Washington Child Support Schedule was derived from the study by Espenshade (1984). Total expenditures for each income level have already been determined with one, two and three children of various ages. From these numbers, the percentage of net income assumed to be spent on children in each income and household composition category is calculated. These numbers are then put together and constitute the economic tables or child support guideline. Since the Engel estimator has been shown to overestimate while the Rothbarth method underestimates child-rearing expenditures, it is commonly felt that numbers used in child support guidelines falling within the Engel-Rothbarth range are reasonable.

Income Shares Model and the Washington State Uniform Child Support Guidelines

Various models have been used to develop child support guidelines used in different states in the country. The most widely discussed models are: the income shares model, the Melson formula model, the percentage of income model and the Cassetty model. These models are based on one of three concepts, namely cost sharing, income sharing or income equalization.

The income shares model was based on the Washington State Uniform Child Support Guidelines. Some 32 states now use the income shares guidelines (Williams, 1994). The income shares model is based on the concept that children should receive the same proportion of income that they would have received if the parents never separated or divorced. In this model, the child support obligation is computed based on the parents' combined income as if they were in an intact family. The basic child support for the child or children is then divided between the parents based on their proportionate share of total income. This method can be used with either gross or net income. The method also allows for adjustments based on shared physical custody, split custody, additional dependents, children's education and visitation-related expenses. The income shares model attempts to ensure that the child still gets the economic benefits of pooled incomes spent for

the benefit of all household members. A child's share of household expenditures includes those goods that benefit only the child as well as those that are consumed jointly, namely food, housing, furniture and recreation.

> *Because the income shares model attributes support to the child on the basis of the spending rate in an intact household, the child is insulated from the lowered living standard resulting from the dissolution (or non-formation). Rather, the overall impact of increased living requirements for multiple households are absorbed by the parents as they allocate shares of their income to children at the same rate as if the household were intact.*[13]

Although the model acts in a way that attempts to maintain the child or children's standard of living, there is no guarantee that they will not suffer a reduction in their standard of living. Indeed, a reduction in the standard of living frequently results because the parents do suffer an overall decline in living standards as resources are used to maintain two households instead of one. One way that the standard of living is maintained is if there is a simultaneous increase in income at the time of dissolution. The income shares model allows for age adjustment of the children. For example, the Washington State guideline originally allowed for three age brackets, *i.e*. 0-6, 7-15 and 16-17. It now allows for two age categories: under 12 and 12 and over.

After the base or basic child support has been determined for each parent, child care expenses and extraordinary medical expenses are added to the basic child support, again, based on the percentage share of each parent's income. Custody arrangements and other dependents can be taken into account using this approach. Policy issues have arisen regarding the "first mortgage" approach where children from prior marriages or relationships are given precedence. The current spouse's income is not considered in the income shares calculations of child support except in cases of unemployment or underemployment. It is also used when the obligor's income is too low. In this situation, the current spouse's income is used to lower the obligor's living expenses, thereby increasing the amount of child support ordered.

The Melson Formula

Judge Elwood F. Melson, Jr. formulated the Delaware Melson formula. The fundamental aspects of this approach require that parents keep a self-reserve amount of income to meet basic needs. Second, the child's basic needs must be met before the parents are allowed to retain any more income than they require for their basic needs. And third, in cases in which income is more than sufficient for basic needs of parents and all dependent children, the children have a right to share in the increased income so as to share the higher living standards of the parents. The Melson formula allows for custody arrangements to be factored into

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[13] Williams, 1987, p. ii-8.

the child support calculations. If a non-custodial parent establishes visitation by having at least 20 percent of the overnight visits, then the obligor's child support is reduced by that percentage. If there are other dependents in the household, this approach subtracts their basic self-support requirements from the income available from the standard of living allowance. Child support from pre-existing court orders is deducted from income after taxes but before determining the child support obligation.

Percentage of Income Model

This model takes either the gross or net income of the obligor to determine child support. The percentage of income model is considered the simplest model since it does not have special adjustments for childcare, children's extraordinary medical expenses, shared or split custody, or additional dependents. Table 2 shows Wisconsin's and Minnesota's proportions of gross and net incomes respectively (Williams, 1994).

Table 2. Percentage of Income Standards for Wisconsin and Minnesota

Number of Children	Wisconsin based on obligor's gross income	Minnesota based on obligor's net income
One	17 percent	25 percent
Two	25 percent	30 percent
Three	29 percent	35 percent
Four	31 percent	39 percent
Five	34 percent	43 percent
Six	NA	47 percent
Seven	NA	50 percent

The Cassetty Model

This income equalizing model was developed by Dr. Judith Cassetty with its main goal to "…ensure that the children of divorced parents suffer the least economic hardship possible and continue to enjoy a standard of living which is as close to the original pre-divorce level as possible."   The Cassetty model starts by subtracting from net combined income a poverty level or subsistence level dollar amount for each parent and for the children for whom support is being sought. Whatever surplus amount is left over is redistributed proportionate to the number of persons in each household unit. The custodial parent's household would receive a higher proportionate amount because of the child or children resident therein. Adjustments can be made for time the child or children are in the physical custody of either parent. It should be noted that the current spouse's income is included in the household's net income. This model does not allow for adjustments for childcare expenses or medical costs.
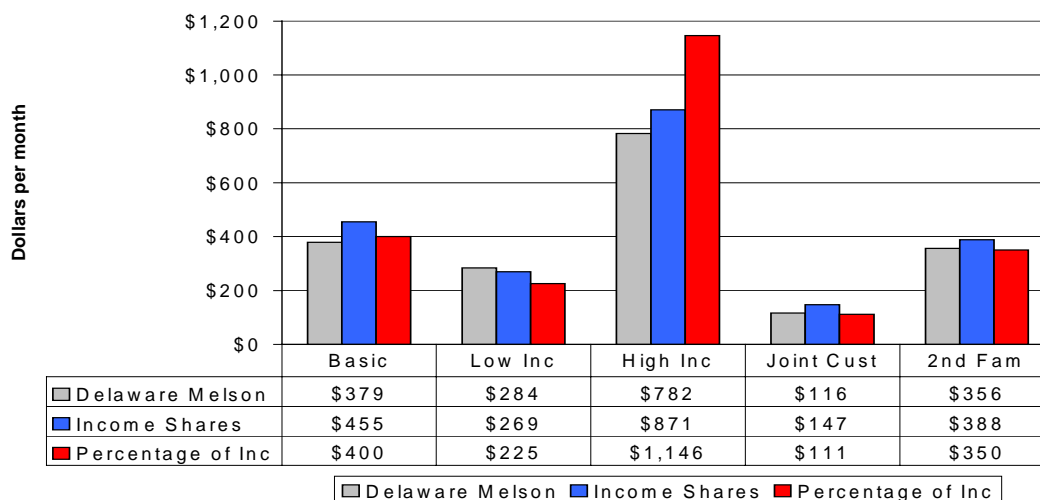
Of the five models that were initially proposed as models for child support guidelines, three have found popular use across the country (Barnow, 1994; Williams, 1987). Namely, the income shares model, which was formulated along the old Washington Uniform guidelines, the obligor percentage of income model, and the Melson Delaware model. Since the Cassetty model is not currently used in any jurisdiction nationally, it will not be discussed here. Figure 1 illustrates these comparisons based on selected fact patterns (Williams, 1987) used as case examples and the different child support amounts obtained from using the three different guidelines. The fact patterns are as follows:

Basic Case: This represents a divorced mother and father with two children aged three and five who reside with the mother. Neither parent has remarried. The mother works and needs child care to allow her to be employed outside the home, thus incurring childcare expenses. For this basic case, all three models yield very similar monthly child support payments. The income shares model yields the higher monthly payment of $455, which is only $76 more than the Delaware Melson and $55 more than the percentage of income model.

Low Income Case: This represents a divorced mother and father with two children aged two and four who reside with the mother. Neither parent has remarried. The mother does not work; she receives an AFDC grant and a Food Stamp allotment. In this case, the income shares model falls in the middle with $15 less than Delaware Melson and $44 more than the percentage of income model.

High Income Case: This represents a divorced mother and father with two children aged 12 and 14 who reside with the mother. Neither parent has remarried. The mother works and needs child care to allow her to be employed

Figure 1. Comparison of Washington's Income Shares with Delaware Melson and Percentage of Income Models

	Basic	Low Inc	High Inc	Joint Cust	2nd Fam
Delaware Melson	$379	$284	$782	$116	$356
Income Shares	$455	$269	$871	$147	$388
Percentage of Inc	$400	$225	$1,146	$111	$350

outside the home, thus incurring childcare expenses. This case yields a wider disparity between the models. Yet Washington's income shares again falls in the middle of the percentage of income and Delaware Melson. The percentage of income amount is substantially higher than the Washington income shares or the Delaware Melson. This is because the percentage of income model does not take the custodial parent's income into account and bases the calculation only on the non-custodial parent's income that in this case is also the higher income.

Joint Custody: The mother and father share legal and physical custody for one 14-year-old child. The mother works outside the home. Washington's income shares falls between the high and the low ends for this case. However, again the difference in calculated amounts is not significant.

Second Families: The mother and father are divorced with two children aged seven and eleven. The children live with the mother. Both the mother and the father have remarried. The father has a five-year-old child in his new marriage. Child support awards in this category are very similar to previous scenarios, with the income shares model falling half way between the two models.

In comparing these different circumstances, it is evident that there is no model that consistently yields the highest or the lowest amount. This means that each case must be reviewed individually and child support calculated based on the unique circumstances of each case. The widest disparity in award amounts occurs in the high-income group in which the percentage of income model is significantly higher than Washington's income shares or the Delaware Melson models. Award amounts using Washington's income shares model appear to fall between amounts awarded by the percentage of income and Delaware Melson models in all but the Basic Case example. It can be said that Washington's income shares model does just as well as the other models. The key factor is to generate the award amounts based on the unique characteristics of each case.

Summary and Conclusions

The main objectives of the 1988 Family support Act were to improve the adequacy of child support orders, to ensure equity towards children for whom child support was being sought, and to increase the efficiency of the adjudication process. To ensure that child support orders were adequate, it was necessary to mandate that child support guidelines were founded on economic data and trends of the times and to allow for periodic adjustments to keep up with changes in economic trends. As a result of this, the federal government funded several studies to determine the level of expenditures necessary to raise a child.

A review of empirical estimates in the literature indicates a wide range of estimates on the cost of raising a child. The varying estimates are a result of different methodologies as well as data from different years and sources,

including underlying assumptions of estimation procedures. Because of these differences, one is led to conclude that there is no consensus on what it costs to raise a child. Joint consumption of certain household commodities has resulted in the need to develop complex and sophisticated estimation methods. The most common of these methods are the Engel and Rothbarth estimators and the USDA's equal shares method.

In addition to the various methodologies discussed, there have been several economic studies on the expenditures on children. Betson provides a comprehensive review of the dynamics of household composition and the effect on the expenditures per child. The main findings of Betson's study are that first, the more children in a family the more it costs, but as the number of children goes up, the average cost per child does not go up.

Lazear and Michael, in their study, found that the marginal cost of an additional child is about 10 percent. However, the addition of an adult lowers total expenditures on children by about 30 percent. Second, as a child grows older, it also costs more to raise that child. Third, the total expenditures as a percent of total household expenditures stay the same across all income levels. The cost of a child to a single-parent household is higher than the cost to a two-parent home, all else being equal. The method selected to derive estimates will make a difference in the final results.

Having reviewed the literature, the Washington State Commission on Child Support (WSCCS) settled on child rearing estimates based on Engel's methodology. After similar careful review of the then-current estimates, the WSCCS chose Espenshade's results and updated them to reflect changes in economic trends between the data years (1972-73) to the 1989 period when the Washington State Child Support Economic Tables were revised to reflect economic costs of child rearing. The Espenshade estimates were supplemented by expenditure equivalence scales to extend the two-child case to four or more children. Since then, more recent studies have been conducted using recent data, specifically the 1990 Betson study which utilizes data over a six-year period, which should offer more precise estimates.

A comparison of the most commonly used models (income shares, percentage of income and Delaware Melson models), under different income and factors in each case, demonstrates there is no model that consistently yields the highest or the lowest amounts. Washington's income shares model performs as well as the other models. The key factor is to generate the award amounts based on the unique characteristics of each case.

An interesting exercise would be to take each fact pattern and calculate child support awards using the different models to see what amount of child support would be awarded under each different model. Finally, while these models allow

the calculation of child support to be awarded, it is not clear that once the funds get to the family that there is equitable allocation to each child. As Lazear and Michael have pointed out, in some social political issues, the question of what happens *within* the family has been conveniently circumvented by acting *as if* it is the family unit that is of interest rather than the individual or individuals within that family. In this context it is not clear that it is known how child support payments really affect the *well being* of the child equitably or otherwise.

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APPENDIX

A Study of Washington State Child Support Orders

Exploring the Universe of Cases within the Context of the Child Support Schedule

ID	Task Name	Oct '00	Nov '00	Dec '00	Jan '01	Feb '01	Mar '01	Apr '01	May '01	Jun '01	Jul '01
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1	Obtain resources										
2	Conduct economic literature review										
3	Develop sampling strategy										
4	Random sample assignment										
5	Develop field data capture forms										
6	Data entry										
7	Obtain orders & worksheets										
8	Conduct case assessment										
9	Conduct comparative analysis										
10	Conduct imputation/default analysis										
11	Link sample files & program files										
12	Analyze linked data										
13	Develop pilot										
14	Conduct legal review										
15	1st Semiannual Report										
16	2nd Semiannual Report										
17	Final Report										